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10/671,359	09/25/2003	Charles Zdzislaw Lobo	614-L	7112
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UNISYS CORPORATION 25725 JERONIMO ROAD, MS400 MISSION VIEJO, CA 92691			EXAMINER TIMBLIN, ROBERT M	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/671,359

Applicant(s)

LOBOZ ET AL.

Examiner

Robert M. Timblin

Art Unit

2167

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-15 and 19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-15 and 19-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

This office action corresponds to application 10/671,359 and applicant's remarks/amendments filed 3/20/2007.

#### ***Response to Amendment***

Claims 1-3, 5-8, 12-15, have been amended and claims 19-20 have been added. Accordingly, claims 1-3, 5-15 and 19-20 have been examined and are pending.

#### ***Claim Objections***

Claim 1 is objected to because the limitation "the initial read/write ratio" in step (i) lacks antecedent basis, as there is no preceding mention of an initial read/write ratio in this claim.

Claims 19 and 20 are objected to as being improper dependent claims for not further limiting the claims in which they depend and being unclear as to whether they contain all the limitations of their dependent claims. In this case, it is also unclear as to whether these claims should be interpreted as independent or dependent claims. See MPEP 608.01.

The same attention should be directed towards claims 5 and 10-15. Changing "A" to "The" in these claims (e.g. claims 5, 10, and 11) may help to clarify the claims as being dependent claims.

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 12, 14, and 19 are rejected under 35 U.S.C. 101 because these claims are directed towards functional descriptive material while lacking the indication of being recorded or stored on a computer readable medium. Specifically, with regards to claims 12, 14 and 19, a computer program is claimed as software *per se* because it is not recited as being recorded on a computer readable medium.

In summary, when functional descriptive material is recorded or stored on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory. As presently claimed, claims 12, 14, and 19 do not clearly indicate the storing or recording of a computer program on a computer readable medium and therefore are not statutory. See MPEP 2106.01.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2, 3, 6, 7, 8, 14, 15, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Krychniak (U.S. Patent 6,192,357 B1).

With respect to claim 2, Krychniak teaches defining a table as an additional entity in the database (fact table of fig. 1); and

storing in said additional entity table the aggregation of said plurality of data values representing an aggregation of at least one of said plurality of conceptual entities contained in said at least one set of linked entities (as the fact table stores the key values of each of the dimension tables; figure 1), whereby the information defining the conceptual entity is obtained by performing a single read operation on the additional entity table (col. 2 lines 11-28 discloses performing a read operation on the fact table; see also figure 4 wherein in certain situations, use of a joins query is avoided).

Similarly, claim 3 is rejected for the same rationale as claim 2 above as it is a method for reading from a database. Since claim 3 contains essentially the same limitations as claims 1 and 2 above, it is rejected for the same reasons.

Similarly, claim 6 is rejected for the same rationale as claims 1-3 above as it is a system for reading from a database. Since claim 6 contains essentially the same limitations as claims 1-3 above, it is rejected for the same reasons.

Similarly, claim 7 is rejected for the same rationale as claims 1-3 and 6 above as it is a system for implementing a database. Since claim 7 contains essentially the same limitations as claims 1-3 and 6 above, it is rejected for the same reasons.

Similarly, claim 8 is rejected for the same rationale as claims 1-3 and 6-7 above as it is a system for implementing a database. Since claim 8 contains essentially the same limitations as claims 1-3 and 6-7 above, it is rejected for the same reasons.

With respect to claims 14 and 19, Krychniak teaches 'a computer readable medium providing a computer program' as an apparatus (claim 6).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5, 12, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krychniak as applied to claims 1-3, 6-8 and 10-17 above in view of Prabhakaran et al. ('Prabhakaran' hereinafter) (US Patent 6,859,758 B1).

With respect to claim 1, Krychniak discloses a method for implementing a database, comprising the steps of:

‘defining at least one set of linked entities’ as dimensions 1-3 (fig. 1). As known in the art, dimensions represent a bounded set of entities (col. 1 lines 27-28, Krychniak). Figure 1 of Krychniak also displays how the Dimensions (1-3) are essentially linked via a fact table. Figure 1 shows “at least set of linked entities.”

‘wherein the at least one set of linked entities contains a plurality of conceptual entities (figure. 1 dimensional tables 1-3 and example tables of figures 2a-2c), each of said conceptual entities including a plurality of data values which are distributed amongst the plurality of said conceptual entities (key value columns; figure 1 and col. 1 lines 10-15);

‘defining an additional entity table in said database’ (fact table of fig. 1).

‘storing in the additional entity the aggregation of a plurality of data values contained in the said at least one set of linked entities (as the fact table stores the key values of each of the dimension tables; figure 1), whereby the aggregated data values may be obtained by performing a read operation on the additional entity’ (col. 2 lines 11-28 discloses performing a read operation on the fact table; see also figure 4 wherein in certain situations, use of a joins query is avoided).

Krychniak fails to disclose determining the initial read/write ratio of the said database; comparing said initial read/write ratio of the said database; and if said initial read/write ratio is greater than said critical read/write ratio, then performing the method steps (i) (ii) (iii) of claim 1.

Prabhakaran, however, discloses (i) determining the initial read/write ratio of the said database (col. 5 lines 50-55 and step 310 of figure 3);

(ii) comparing said initial read/write ratio of the said database to a critical read/write ratio (col. 6 lines 31-47 and step 330 of figure 3); and

(iii) if said initial read/write ratio is greater than said critical read/write ratio (col. 6 lines 44-47) then performing the method steps (a) (b) (c) of claim 1 as seen in the rejection of claim 1 above (which is taught by Krychniak above).

In the same field of endeavor (i.e. addressing space efficiency in data storage; col. 1, line 39 of Krychniak and col. 1 lines 26-27 of Prabhakaran), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because Prabhakaran's teaching would have allowed Krychniak to measure the performance of a storage system (Prabhakaran, col. 2, lines 20-23). Furthermore, read and/or write commands would be provided to test the storage system (Prabhakaran, col. 2, lines 30-42) to further optimize the query generation system of Krychniak by indicating the behavior of Krychniak's system (col. 6 lines 44-47). Accordingly, Krychniak discloses a need for Prabhakaran's system when their system needs to determine how the database handles a query (behavior) and which optimizing scheme to use (col. 2 lines 23-37).

With respect to claim 5, Krychniak fails to teach the limitations (ia-ie) of this claim.

Prabhakaran, however, discloses 'providing data with regard to the time taken to perform a read operation and a write operation on a first implementation of the said database' as generating read/write commands to a database storage system (col. 2, lines 30-42 and fig. 3).

'providing data with regard to the time taken to perform a read operation and a write operation on a second implementation of the said database' as stress tests can be spawned against a plurality of databases (col. 2, lines 35-40).



‘calculating a read time difference between the time taken to perform a read operation on said first implementation of said database and on said second implementation of said database’ and ‘calculating a write time difference between the time taken to perform a write operation on said first implementation of said database and a second implementation of said database’ as testing all reads and all writes as there may be a performance difference between read and write operations (col. 5, lines 55-65). Furthermore, performance measures include a mixture of read and write operations for comparing architectures (i.e. first and second implementations) (col. 7, lines 10-18).

‘calculating the ratio between the read time difference and the write time difference to determine the said initial read/write ratio for said database’ as statistical information containing read and write operations completed by the database (col. 6 line 62 – col. 7, line 2). Furthermore, performance measures include a mixture of read and write operations for comparing architectures (col. 7, lines 10-18).

In the same field of endeavor (i.e. addressing space efficiency in data storage; col. 1, line 39 of Krychniak and col. 1 lines 26-27 of Prabhakaran), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because Prabhakaran’s teaching would have allowed Krychniak to measure the performance of a storage system (Prabhakaran, col. 2, lines 20-23). Furthermore, read and/or write commands would be provided to test the storage system (Prabhakaran, col. 2, lines 30-42) to further optimize the query generation system of Krychniak by indicating the behavior of Krychniak’s system (col. 6 lines 44-47). Accordingly, Krychniak discloses a need

for Prabhakaran's system when their system needs to determine how the database handles a query (behavior) and which optimizing scheme to use (col. 2 lines 23-37).

With respect to claim 12, Krychniak discloses a computer program arranged, when loaded on a computing system, to implement the method' as an apparatus (claim 6).

With respect to claim 20 Krychniak teaches a computer readable medium incorporating a computer program in accordance with the method of Claim 1 (figure 3).

Claims 9-11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krychniak as applied to claims 1-3, 6-8, and 10-17 above, the combination of Prabhakaran and Krychniak as applied to claims 4, 5, and 9 above and further in view of Szendy et al. ('Szendy' hereafter)(U.S. Patent 6,681,309).

With respect to claim 9, this claim is rejected essentially the same as claim 5 above. Furthermore, Prabhakaran teaches establishing a critical read/write ratio (CRW) which provides the ratio of the average number of reads from the entity that are needed for each write to the entity as using an approximate read to write ratio (col. 5 lines 61-65).

Although Prabhakaran teaches a system for stress testing databases and recording performance measurements, they do not expressly disclose using those measurements to increase performance in those databases. Therefore, Krychniak and Prabhakaran combined fail to teach

utilizing said critical read/write ratio to increase performance in said database when said initial read/write ratio is greater than said critical read/write ratio.

Szendy, however, teaches utilizing said critical read/write ratio to increase performance in said database when said initial read/write ratio is greater than said critical read/write ratio as using the ratio of reads to writes to optimize the use of storage (col. 3, lines 24-30).

As Krychniak, Prabhakaran and Szendy are all in the same field of endeavor (i.e. efficiency of data storage), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because the above teaching of Szendy would have provided to the combination of Krychniak and Prabhakaran a way to measure and optimize the spatial structure of storage (col. 2 lines 23-28, Szendy) for the benefit the optimization of the storage medium.

With respect to claim 10, Krychniak discloses 'at least one set of linked entities' (fig. 1).

With respect to claim 11, Krychniak discloses 'an aggregation of all data values stored in the at least one set of linked entities' fact table (fig.1).

With respect to claim 13, Krychniak discloses 'a computer readable medium providing a computer program' as an apparatus (claim 6).

*Response to Arguments*

Applicant's arguments filed 3/20/2007 have been fully considered but they are not persuasive.

Applicant argues on page 9 that Krychniak is silent to teaching the aggregation of information which defines a conceptual entity, and storing said data in a single table, so that the information may be extracted utilizing a single read operation. The Examiner respectfully disagrees as provided below:

As per the argument to Krychniak failing to teach information defining the conceptual entity, the Examiner asserts that the dimensional tables of Krychniak are defined essentially by the entities contained within them. In col. 1 line 26, Krychniak teaches dimensions represent a bounded set of entities (i.e. entities of each dimension define the information for that respective dimension).

Further, the Examiner respectfully submits that Krychniak teaches a "conceptual entity" sufficiently as describing the separate sets of entities as dimensions. A dimensional table is essentially a concept to represent a set of entities.

Further yet, Krychniak teaches a single read at least from the query in col. 2, line17-22 where a single read is used with a fact table to gather aggregate information.

Applicant further argues on page 10 that neither reference teaches "comparing" an initial read/write ratio. The Examiner respectfully disagrees as this is taught in Prabhakaran at col. 6 lines 31-47 wherein it is taught of the correlating between a stress test and production

environments. Prabhakaran also teaches in this paragraph corresponding actual read and write operations of a production environment to those of a database storage system. Further yet, Prabhakaran teaches the step of comparing in col. 5 line 49-65 wherein a desired read to write ratio is set and is tested against. One of skill in the art would understand that comparing read to writes of a test to the desired read to write ratio would need to be conducted in order to obtain performance results. Accordingly, Prabhakaran sufficiently teaches Applicant's step of comparing.

Applicant argues on page 10 that the steps of claim 1 are not performed if the initial read/write ratio greater than a critical read/write ratio. The Examiner respectfully disagrees because in the combination of Krychniak and Prabhakaran, it would have been obvious for Krychniak to use the performance measurements of Prabhakaran to create a fact table of aggregated dimensional data in the interest of space efficiency. Krychniak further discloses a need to determine database performance in col. 2 lines 23-25 wherein he tries to determine how the database handles a query (i.e. performance).

Furthermore, in light of claim 9, it is described by Szendy that read and write ratios can be used to optimize the use of storage (col. 3 line 24-30, Szendy). Szendy also teaches combining portions of a database according to access activity measurements (abstract).

The Applicant states on page 11 of the response that there is no basis to equate Prabhakaran's situation to the Applicant's. The Examiner respectfully disagrees because Prabhakaran's approximate ratio can be equated to Applicant's critical read/write ratio. As

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stated in Applicant's claim 9 step (g), a critical read/write ratio provides the ratio of the average number of reads from the entity that are needed for each write to the entity. Thus, the interpretation from this claim can lead to the belief that Prabhakaran's approximate ratio teaches Applicant's critical read/write ratio (i.e. Prabhakaran's approximate ratio approximates a set of real applications to simulate an actual use of a database storage system).

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert M. Timblin whose telephone number is 571-272-5627. The examiner can normally be reached on M-F 8:00-4:30.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Cottingham can be reached on 571-272-7079. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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